

**ALTERNATE
FIRING TWIN**
7.2 H. P.
44 LBS. (Approx.)
**CERTIFIED AT
4000 R.P.M.**

SPECIFICATIONS . . .

Power Head	- - - - -	Alternate Firing
Bore and Stroke	- - - - -	2x1¾
No. of Cylinders	- - - - -	2
Certified Brake H.P. at 4000 R.P.M.	- - - - -	7.2
Piston Displacement	- - - - -	11 Cubic Inches
Propeller Diameter Pitch	- - - - -	8x8¼
Fuel Tank Capacity	- - - - -	1 gallon
Starter	- - - - -	Depend-A-Pull
Ignition	- - High Tension, Positive Action Magneto	
Carburetor	- - - - Full Range, Dual Adjustment, Concentric Bowl Type	
Gear Ratio	- - - - -	13-20
Type of Exhaust	- - - - -	Pre-Cooled Underwater
Cooling System	- - - - -	Positive Displacement Rotor Type Water Pump
Steering	- - - - -	Full 360° Pivot
Stern Height	- - - - -	15"
Weight	- - - - -	(Approx.) 44 lbs.
Full Reverse	- - - - -	Yes

I.
STARTER COVER ASSEMBLY
(Refer Picture, Page 6-13)

TO DISASSEMBLE:

A. Remove 4 screws located at each corner of starter housing. Keep filler cap latched during removal of starter. Care should be taken in removing filler cap assembly (144) which on some of the earlier motors is not attached. There is a possibility of losing assembly especially if starter cover is removed from motor while on water.

B. Remove pivot bolt screw (136) and lift off pivot bolt cover (135).

C. Place screw driver in pivot bolt slot to retain spring tension while loosening pivot bolt nut (134) which will disengage starter assembly from housing.

D. Remove fiber disc (129) from starter cover.

E. If it is necessary to replace starter cord assembly, unhook pull cord from slot in pulley to free cord assembly. On later models it will be necessary to remove the starter pulley rivet as shown in information given in Sec. X, S.B. No. 25.

F. Unhook starter bias spring (138) from pawl retainer assembly and starter pulley assembly.

G. Remove screw (131) from spring anchor (130). Firmly grasp starter mechanism in both hands and holding by both the pulley drum and pawl retainer, force out pivot bolt by applying pressure from above with both thumbs.

H. Remove pawl retainer assembly (137) and spring washer (139).

I. Octagonal friction spring (127) can be removed from starter pivot bolt (132) if necessary.

J. Remove spring anchor (130).

K. Remove starter rewind spring (128).

(CAUTION: Use care in removing spring from well in pulley as this is under heavy tension and may fly loose).

L. Remove spring washer (139) from well in pulley.

M. Remove fiber disc (129) from well in pulley.

TO REASSEMBLE:

A. Place octagonal friction spring around pivot bolt. Reink spring at each bend to increase spring tension if necessary.

B. Insert pivot bolt into pawl retainer assembly through opening beginning at opposite side of smooth face of assembly. It will be necessary to compress octagonal friction spring in groove of starter pivot bolt to accomplish this. Start at one end and compress spring with

screw driver at each bend, meanwhile exerting pressure on pivot bolt with thumb at all times. Be sure the octagonal spring sets at all times in the groove of pivot bolt. (Refer Fig. 4-1).

C. Replace fiber disc (129) in well of starter pulley assembly.

D. Replace spring washer (139) over fiber disc (129) in well of pulley.

E. To replace rewind spring, hold pulley assembly with well up. Insert outer spring anchor into slot of pulley assembly and gradually work spring into position. (CAUTION: Install in a counter-clockwise direction).

F. Reink spring washer (139) if necessary and place over pivot bolt on flat face of pawl retainer assembly. If there is an indication of wear or break in the spring washer, a replacement should be made.

G. Hold pawl retainer assembly in hand with index finger inserted into pivot bolt opening and replace pulley assembly making sure that the three pulley pins are engaged in the pawl slots.

H. Retain pressure on starter pivot bolt while replacing spring anchor (130). Match openings between pivot bolt and spring anchor and replace screw.

I. Turn pivot bolt to position where rewind spring can be properly inserted and attached to spring anchor opening.

J. Turn over mechanism and properly center spring washer located between pulley and pawl retainer. Spring will help align itself if shifted in proper position.

K. Before reassembling starter cord, be sure it is first inserted into starter cover opening. Check opening for any burrs that may damage covering of cord.

L. Engage starter cord hook into slot found on underneath side of pulley assembly. Wind cord $\frac{1}{2}$ turn and insert rivet as shown in Sec. X, S.B. No. 25. Complete rewind of cord.

M. Replace fiber disc (129) over pivot bolt hole in starter housing. Care should be taken to see that it is properly centered and that it retains its position.

N. Complete starter mechanism is now ready to install in housing by placing it so that pivot bolt enters center hole in housing. Hold starter assembly in housing with one hand and screw on pivot nut and washer with other hand.

O. Place screw driver in pivot bolt slot and turn bolt $1\frac{1}{2}$ turns counter-clockwise; then lock pivot nut with wrench. Tension adjustments can be made as desired.

P. Replace starter bias spring. Pair of needle nosed pliers should be used. Attach hook end of spring into opening in pawl assembly opposite anchor hook of starter cord assembly and attach to anchor found on starter pulley assembly.

bly. Tension of bias spring aids in holding the pawls in retracted position while motor is in operation.

Q. Place assembled starter mechanism and housing on tank and secure with 4 corner screws.

R. Methods of aligning starter mechanism.

1. To check alignment of starter mechanism place a small pin in the pivot bolt hole. When alignment is correct, pin will drop in crankshaft center and stand vertical. If correction is necessary, place screw driver in pivot bolt slot to retain rewind spring tension while loosening nut with wrench, then shift pivot bolt, tighten nut and check for vertical pin position.
2. Alignment of starter while motor is running. Run motor at low speed. If starter is not centered properly, a noise will be prevalent. Place screw driver in pivot bolt slot to retain rewind spring tension while loosening nut with wrench. Shift pivot bolt until noise is eliminated and tighten nut. Starter should then be properly aligned.
3. Alignment of starter by use of a starter centering ring PN 25268.
 - a. Loosen lock nut on pivot bolt.
 - b. Remove starter assembly.
 - c. Place ring over magneto nut.
 - d. Replace starter assembly and all four screws.
 - e. Turn pivot bolt to left until starter knob hits housing and turn $\frac{3}{4}$ turn more and tighten lock nut securely.
 - f. Remove starter and centering ring and replace starter assembly.

II.

FILLER CAP ASSEMBLY (Refer Picture, Page 6-13)

TO DISASSEMBLE:

- A.** Remove air vent bushing (148) and washer (147) holding rubber tank seal (146).
- B.** Remove spacer for tank seal (145), spring for vent seal (149) and ball for vent seal (150).
- C.** To remove air vent screw PN 25210 remove vent retainer pin found on underside of filler cap cover.

TO REASSEMBLE:

- A.** Reverse above procedure.

SERVICE HINTS:

- A.** On later model motors a retainer clip (152) is used to prevent loss of filler cap assembly when starter cover is removed.

B. In case of leak around filler cap assembly replace tank seal with new seal PN25699 and washer PN 35-S-33. If this fails to eliminate leak, check tank opening for distortion causing improper sealing.

C. In case of starter failure, filler cap assembly may be removed from starter and inserted into tank opening.

D. If filler cap assembly fits loose, change tension spring (141) of filler cap latch. If necessary, file boss on underneath side of filler cap latch (140) to secure increased tension.

III.

TO REMOVE FUEL TANK AND SHROUD (Refer Picture, Page 6-13)

A. First remove all screws retaining rear shroud (165) and pull this section off.

B. Remove control knobs (167) and screws holding front shroud (163) and remove this section.

C. Before removing fuel tank (156) drain all fuel by inverting motor.

D. Detach fuel line (173) from tank to carburetor.

E. Remove 2 screws and release speed control knob (169) from control lever.

F. Remove 4 screws located beneath tank attaching tank to brackets. Tank can now be lifted upward and off over flywheel.

TO REPLACE:

- A.** Reverse the above operation.

REASSEMBLY OF CHOKE CONTROL AND CARBURETOR

A. On all model motors manufactured prior to the '49ers the prime and choke mechanism was controlled by a flexible cable. To correctly install this cable it will be necessary to remove rear shroud.

B. With choke butterfly valve (9) (found in exploded view of carburetor page 6-16) in off position or run position, insert flexible shaft into choke shaft of carburetor.

C. Rotate flexible shaft until pin in the opposite end points towards rear of motor.

D. Assuming butterfly has not changed position, tighten set screw.

E. Install front shroud and secure screws, meanwhile pushing loose end of choke control cable through proper opening in shroud.

F. With choke valve in run position (or open) install knob with arrow pointing to "word" run found on decal.

G. Use a long screw driver or other similar tool and it is comparatively simple to reach behind left side of front shroud and hold choke cable fitting tightly against front shroud so the control knob can be installed. (Refer Fig. 6-1).



Figure 6-1

H. After installation is completed, it may be checked by turning choke control from run position to prime position. The small pin located in the end of the choke cable acts as a stop when run and prime positions have been reached. This is a precaution against damage to choke cable through being turned too far.

NOTE: Beginning with the '49 models all motors were manufactured with a rigid prime and choke mechanism. For further information see Sec. X, S.B. 11.

IV.

WICO MAGNETO SERIAL F.W.Z.A. (Refer Picture, Page 6-16)

TO DISASSEMBLE:

- A. Remove 3 screws (36) and lift starter ring (35) from flywheel.
- B. Remove flywheel nut (28) and washer (29).
- C. Use Martin magpuller as follows:
 1. Place magpuller over protruding end of crankshaft and align its 3 holes with 3 screw holes in flywheel.
 2. Unscrew center bolt in magpuller until it rests flush on flywheel.
 3. Insert 3 magpuller screws and draw down firmly. (CAUTION: Use only 3 screws furnished with magpuller or screw PN 25225. Longer screws will internally damage magneto. Tighten center screw of pul-
ler until flywheel is loosened. **Under no condition should you strike protruding end of crankshaft to loosen flywheel.**)
- D. Detach lead wires from spark plugs.
- E. On earlier model motors it will be necessary to disengage synchronized control rod from carburetor.
 1. This can be done by placing speed control lever in "stop" position and opening carburetor throttle by manually pulling it towards the operator. This will release end of control rod and its spring. (On la-

ter models carburetor timing is controlled by cam. Further information on this may be found on page 6-7).

F. Remove key (33) and cam (32).

G. Loosen stator plate tension screw (31) located on underside of magneto and lift stator plate from its location.

TO REASSEMBLE:

A. Replace stator plate on hub of block and case assembly.

B. On those motors using carburetor control rod and spring be sure these are properly assembled.

C. Tighten stator plate tension screw until correct tension is obtained.

D. Replace cam and key. (CAUTION: Cam must be replaced with arrow up, otherwise the motor will be out of time).

E. Breaker points should be checked for proper setting (.020). Complete information on magneto will be found in following paragraphs.

F. Remove magpuller from flywheel and place flywheel over magneto making sure key alignment is checked.

G. Replace washer (29) and nut (28).

H. Hold flywheel securely and screw flywheel nut as tightly as possible on crankshaft end. (CAUTION: Be positive flywheel nut is tight. Use of socket wrench recommended).

DESCRIPTION:

The FW2A-24 series is a two cylinder alternate firing flywheel type magneto with a pole shoe radius of 2.4 inches, delivering two sparks per revolution occurring 180° apart.

The design of the magneto provides a compact ignition unit, simple in construction and with all parts easily accessible for servicing. Incorporating two completely separate electrical circuits the magneto supplies independent ignition for each engine cylinder. This feature provides a reliability of operation previously unknown in the outboard magneto field. Its spark producing characteristics are such that an extremely hot spark is generated at low speed insuring easy engine starting and sufficiently strong spark is produced throughout all speed ranges for efficient engine operation.

The magnetic unit consists of an alnico type magnet assembled in a laminated core and cast into a zamac rotor. This rotor serves as the flywheel of the engine. It is ribbed inside to resist centrifugal force.

The cam is highly polished and wear resistant lubricated by two cam wiper felts which are factory impregnated with long-life grease.

The stator plate unit includes the breaker mechanisms, which are of a reciprocating design, the coil and laminated coil core units and the condensers.

SERVICE INSTRUCTIONS:

A. Checking magneto for spark.

1. It is recommended that if there is an indication the magneto is causing trouble that a test be made before attempting to repair it.
2. If the engine refuses to start, the magneto can be checked by holding the spark plug cable about 1/16" away from a point of the frame of the engine. When the engine is cranked in the usual way, a properly performing magneto should jump this gap.
3. If the engine misses at high speed, first check the spark plug. With the spark plug in good condition and properly adjusted, the magneto should fire a spark without missing while the spark plug cable is held 1/16" away from the spark plug terminal.

B. Adjustments of Contacts.

1. The only adjustable parts on the FW magneto are the fixed contact plates which provide adjustment for the breaker contacts.
2. To adjust these contacts, first remove the flywheel or rotor. Turn the engine over until the crankshaft keyway is pointing to one set of points, and measure the opening between the contacts with a feeler guage. The opening should be .020. If the contacts need adjusting, loosen the fixed contact screw until the fixed contact plate can be moved. Move the contact plate until the opening between the contacts measures .020 and then tighten the screw. (Refer Fig. 5-2). This operation should be repeated with the other breaker contact to synchronize the breaker mechanisms. If the breaker contacts are pitted or worn, they should be replaced. To replace the contact, remove the condenser connection screw and the fixed contact clamp screw. The contacts can then be removed from the stator plate. If necessary, the breaker spring can then be removed by taking out the breaker clamp screw and lock washer. If the contacts need replacing, it is recommended that both the fixed and the movable contact be replaced at the same time.

C. Removal of condenser.

1. To remove the condensers, first remove the condenser connection screw, lock washer and lead. Then remove the condenser clamp screw and lock washer. The condenser may then be lifted from its socket. The condenser capacity is .16-.20 microfarads and the part should be replaced if the reading falls above or below this when checked. Condensers should also be checked for continuity.

MARTIN "60" WICO MAGNETO

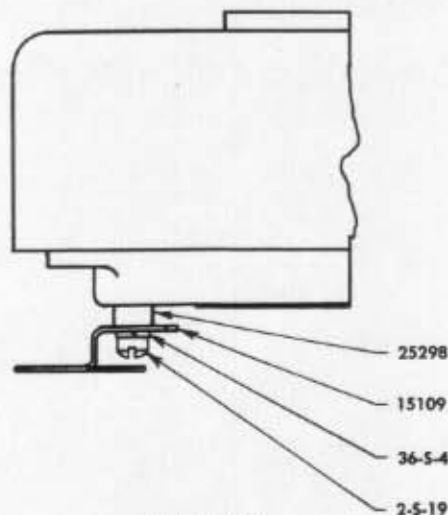


Figure 6-2

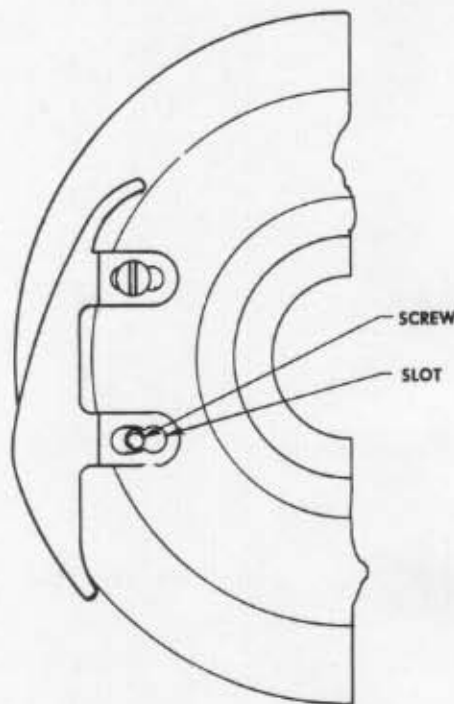


Figure 6-3

D. To replace the coils.

1. To remove the coils, first disconnect the two coil primary leads from the condenser post and condenser clamp; then remove the two core screws which fasten the laminated core to the stator plate. Using a screw driver, pry up the core from the dowel pins which position it on the stator plate.

2. Remove the rubber coil terminal protector from around the coil and disconnect the spark plug lead wire.
3. With the coil and core group removed from the stator, bend up the coil locking lamination and using an arbor press, remove the coil from the core. Remove the wedges from inside the coil.
4. The new coil can then be assembled to the core and the wedges driven between the core and the coil. Before fastening the core on the stator plate, connect the spark plug lead wire to the coil terminal. Make sure that the core screws are securely tightened. Connect the black coil lead to the condenser post and the stranded lead to the condenser clamp. (Note: Pole shoes are not interchangeable from one side to the other).

E. Lubrication.

1. The cam wiper felts either should be replaced each season or re-oiled with a few drops of heavy oil. No other lubrication of the magneto is necessary.

V.

CARBURETOR CONTROL CAM

(Refer Figure 6-2, 3)

TO DISASSEMBLE:

A. Remove the following parts as shown in figure in sequence order shown.

1. 2-S-19 cam locating screws.
2. 36-S-4 cam locating washers.
3. 15109 carburetor control cam.
4. 25298 spacers.

TO REASSEMBLE:

A. Reverse the above procedure. (CAUTION: Be sure cam slot is located on screws as shown in figure). Information on synchronization of carburetor throttle and magneto will be discussed in Paragraph VI).

CARBURETOR

(Refer Picture, Page 6-16)

TO DISASSEMBLE:

A. Unscrew main adjusting screw gland (24) and remove complete main adjusting screw and gland assembly from fuel bowl (14).

B. Remove 4 body retaining screws and lock-washers (4) to separate upper body and fuel bowl.

C. Unscrew float lever pinion pin (13) and remove float (12) from fuel bowl.

D. Unscrew fuel bowl plug screw (16), then inlet needle, seat and gasket assembly (21) from fuel bowl.

E. Unscrew idle adjustment screw (17) and spring (18).

F. Unscrew idle tube and gasket (19) and (20).

G. Unscrew main nozzle channel plug screw (29) from upper body.

H. Remove throttle shutter (36) by unscrewing throttle shutter screw (37), then carefully remove shutter with long-nosed pliers. (CAUTION: Avoid marring walls of throttle barrel).

I. Remove throttle shaft return spring (35) and withdraw throttle shaft and lever assembly (34).

TO REASSEMBLE:

Follow Reverse Procedure.

CARBURETOR SERVICE HINTS:

A. After carburetor is disassembled per above instructions and all parts thoroughly washed in clean gasoline, three sections of the unit should be carefully blown out with clean compressed air as follows:

1. Main nozzle and air bleed vent tube. It is only necessary to remove main nozzle from upper body casting when replacement is required or to be cleaned.
2. Idle fuel supply channel. Install idle tube and gasket in upper body casting and then place air hose at open end of idle fuel supply channel at that point where idle adjustment screw installation is made.
3. Fuel inlet channel. Place air hose at that point of fuel body, where fuel line connection is made and carefully blow out fuel inlet channel.
4. Choke shaft and primer plunger assemblies, or parts thereof, should not require removal or replacement unless accidentally damaged or broken. However, choke shaft friction pin and spring may require replacement if found badly worn after lengthy service.
5. When installing float be sure the yoke or slotted end of float lever is inserted thru the groove around blunt end of inlet needle so that float movement will control inlet needle.
6. Further service data on carburetors will be found in Sec. X, S.B. 11 and 18. (Note: Never attempt to blow out a carburetor with compressed air unless the bowl is removed).

VI MANIFOLD AND VALVE MECHANISM

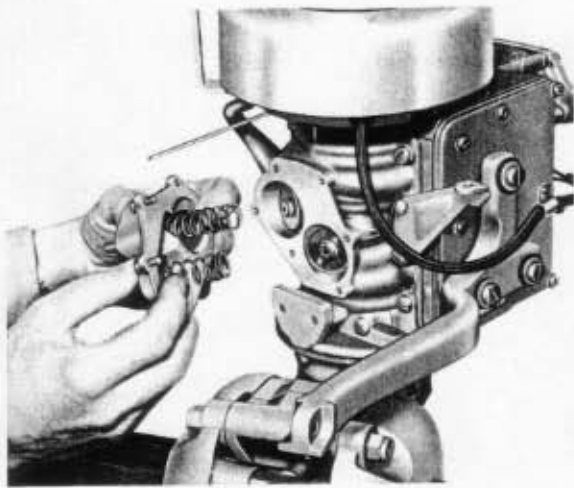


Figure 6-4

TO DISASSEMBLE:

- A. First remove carburetor.
- B. Remove all screws but one bordering the manifold.
- C. While removing last screw apply considerable manual pressure to center of manifold thereby offsetting valve spring tension. Manifold thus becomes detached and springs will drop loose.
- D. Valves can be removed by fingers. **CAUTION:** Be sure you mark valves and properly identify them so that they can be replaced in the same valve seat. **NOTE:** It is also recommended that manifold gasket be kept in water until reassembled in order that it remain pliable. **SERVICE HINTS:** While manifold and valves are disassembled, refer to Sec. X, S.B. 10 for other information.

TO REASSEMBLE:

- A. Follow reverse procedure and refer to Figure— showing method of retaining springs in proper position. (**CAUTION:** Be positive springs are engaged on valve head boss and ring assembly. After assembly this spring alignment can be usually checked through fuel intake hole).

SYNCHRONIZATION OF MAGNETO AND CARBURETOR THROTTLE

(Refer Picture, Page 6-11)

A. Rod controlled timing.

1. Place magneto control lever in stop position.
2. Place linkage spring on control rod.
3. Insert rod in carburetor throttle lever.

4. Manually open throttle lever and adjust rod collar so that it starts to open throttle when magneto lever is about one half inch left of center.

B. Cam controlled timing.

1. Cam should be installed with screws in elongated slots as shown in figure 6-3.
2. Adjust rod of carburetor or butterfly linkage (68) so that throttle of carburetor begins to open when speed control knob is approximately $\frac{1}{2}$ inch left of center.
3. Check for grinding or failure of throttle valve to open completely by moving speed control knob to fast position. If there is indication of the above failure, relocate cam by loosening screws and making necessary adjustment. Recheck throttle pick-up time.

VII POWERHEAD

(Refer Picture, Page 6-11, 12)

TO DISASSEMBLE:

To disassemble powerhead, remove the following parts: Starter cover assembly, front and rear shrouds, fuel tank, flywheel, magneto, carburetor and valve and manifold assembly as previously explained.

There are two procedures to follow, each depending on which internal part or parts of the powerhead are to be examined or checked.

A. If pistons are not to be removed.

1. Loosen 12 screws (52) (53) (54) holding crankcase to block.
2. Remove spark plugs (1).
3. Remove screws (228) holding powerhead to lower unit and detach powerhead.
4. Remove 3 screws from casting (43).
5. Remove 12 crankcase screws (52) (53) and (54) which were previously loosened.
6. Detach crankcase from cylinder block.

(**CAUTION:** Do not use any tool in separation of block and case that can in any way damage parting faces of cylinder block and crankcase assembly).

The above breakdown of powerhead permits inspection or replacement of the following parts: Crankcase, cam followers and pins, bearings and crankshaft.

B. Complete breakdown of powerhead.

1. Remove spark plugs.
2. Remove cylinder head screws (4) and detach cylinder head (11). Separate cylinder head and cover (8).
3. Remove screws from intake port cover (81) and detach.

4. Remove screws from exhaust port cover (89) and detach. Separate cover and plate (87). (Note: If replacements are necessary on grommets at steering handle bracket, it is advisable to do this before removing exhaust port cover from powerhead).
5. Loosen 12 screws holding block to case.
6. Remove screws holding powerhead to the lower unit and detach powerhead.
7. Remove 3 screws and casting (43) found on underneath side of powerhead.
8. Remove screws holding block and case together.
9. Remove oil seals (40) and (45).
10. Mark cam followers (17) and remove from crankcase assembly.
11. Remove screws holding connecting rod caps (25) keeping each screw in its original position. Caps and rods should be marked to insure correct assembly.
12. Remove crankshaft (27) and journal bearing (41) and (42).
13. Pistons (21) may now be removed by pressing on cap ends of rod and forcing pistons out of top side of block.
14. To remove piston from connecting rod, take out two (2) wrist pin lock springs (22) from hole on either side of piston, at opposite ends of wrist pin. Carefully press or tamp out wrist pin from piston. Recommend use of wrist pin punch PN 25492. If tamping is necessary, support piston in palm of hand while doing so to prevent distortion of piston assembly.
15. If necessary to replace rings (23), remove old ones by expanding top ring and work off over top end of piston using care not to mar outer piston wall. Remove second and third rings in sequence and in the same manner.

TO REASSEMBLE:

- A. Replace all old gaskets with new gaskets.
- B. Replace connecting rod on wrist pin in piston. Be sure rod assembly and piston are properly identified so that they are inserted into the proper cylinder bore.
- C. Install wrist pin lock spring.
- D. Clamp assembly in padded vise gripping connecting rod. Rings may now be easily replaced around pistons. (CAUTION: Factory rings are stamped "Top" and should be installed correctly. Align ring gaps with pins in piston grooves).
- E. Coat both the cylinder wall and piston and rod assembly with oil before installation.
- F. Use ring compressor PN 25306 and place piston and rod assembly in cylinder, connecting rod end first. Be sure piston ring slots and retaining pins are matched, otherwise rings



Figure 6-5

cannot be compressed. (CAUTION: Be sure tapered side of piston faces exhaust ports).

G. Replace journal bearings on crankshaft and set crankshaft in position so that connecting rod caps may be replaced. A small hole is drilled in each journal bearing. These holes must match with pins located in cylinder block. Lubricate bearings and place so that holes are engaged.

H. Be sure rod caps are installed properly and on correct rod. Check identification marks made in disassembly. Double check connecting rod cap screws for tightness. Check rod and crankshaft for end play which is essential. If no end play exists, loosen connecting rod cap, then retighten. Repeat operation until slight end play occurs.

I. Replace cam followers spacer washers on cam followers pins then replace cam followers on pins. Install cam follower so that drilled oil hole is visible through the intake manifold.

SERVICE HINTS: Refer to Sec. X, S.B. 26 for further information on new cam follower used on all "60" motors after serial number 66122.

J. Spread thin film of 3M sealer on parting faces of block and case assembly. When assembling case and block, lay assembly on side so cam followers do not drop out of place. (Refer Fig. 5-6).

K. Replace screws attaching block to case. Be sure tank brackets (55) are in place. Before drawing screws tight turn motor over by hand to make sure that cam followers are in proper channels and that journal bearings and anchor pins match. If powerhead functions properly, tighten screws.

L. Install water seal brass washer (47) and rubber washer (48) in recess in bottom of block and case assembly. Replace oil seal (45) and replace driveshaft seal enclosure casting (43) and gasket (46) and secure with three screws.

M. Replace powerhead on lower unit. Make sure the water tube, driveshaft and enclosure are properly inserted before tightening screws. Lockwasher is used with all 7 screws.

N. Replace exhaust port cover and plate with necessary gaskets. (CAUTION: Gasket (86) with enclosed water passages should be between exhaust port cover plate and cylinder block).

O. Replace intake port covers and gaskets.

P. Before installing cylinder head be sure that all gasket surfaces are thoroughly cleaned. (Refer to Sec. X, S.B. 28). Replace cylinder head cover gasket and spark plug gaskets. Place cylinder head cover on head and insert spark plugs after checking gaps for .030. Spark plugs will hold plates and gaskets in place.

Q. Replace cylinder head screws and washers. **Make sure rear tank bracket is in place.**

R. Replace gaskets (12) and (13) and place cylinder in position. Caution should be taken to see that no gaskets or sealer gets into cylinder bores. Tighten and adjust screws in following sequence: Center 2 screws first, then the extreme top 2 and bottom 2 screws tightly; then the remaining 4 snugly. Recheck after motor has test run.

S. Replace oil seal (40) on crankshaft. Spread film of 3M sealer around outer band of seal. Work seal over step on shaft to avoid folding seal. Continue working seal down by hand as far as possible. Then with a tube large enough to fit loosely over crankshaft, carefully drive downward until seal bottoms.

VIII.

STEERING STABILIZER

(Refer Picture, Page 6-15)

TO DISASSEMBLE:

A. Reduce tension on four stabilizer adjusting screws found on underneath side of motor support tube casing.

B. With motor in full reverse position, remove 4 screws holding rear half of the motor support tube casing (289). A slight movement exerted on the gear case housing will free the rear half of the motor support tube casing so that it can be removed by hand.

C. Turn motor to forward steering position and lift the complete powerhead and lower unit from the front half of the motor support tube casing which is attached to stern bracket assembly.

D. Mechanism of steering stabilizer is now exposed. The 2 halves of the stabilizer friction ring (223) and stabilizer compression plate and block can now be removed.

TO REASSEMBLE:

A. Replace stabilizer friction plates, blocks and friction rings in respective recesses in front half of motor support tube casing.

B. Replace motor and turn motor 180° to lock motor to the stern bracket during the remainder of the assembly.

C. Place remaining stabilizer compression plates, blocks and one friction ring in rear half of motor support tube casing. Carefully place this unit in its former position attaching it to rest of assembly.

SERVICE HINTS: As an aid in this operation use the blade of a small screw driver to hold down the washer and elevate the rear half of motor support tube housing so it can snap into place. Note: Refer Sec. X, S.B. 12.

D. To adjust steering stabilizer, firmly tighten any one of 4 adjusting screws found on underneath side of casing. Adjust the other three screws until expansion is visible on the rubber compression blocks. Relieve tension on the first screw tightened until the compression on its rubber block is relative to the other three blocks. At this point you may test for firmness of steering action. If action is unsatisfactory, adjust tension of all 4 screws accordingly. If motor steers hard at high speed, refer to Sec. X, S.B. 12.

IX.

STERN BRACKET

(Refer Picture, Page 6-15)

TO DISASSEMBLE:

A. Remove nut (266) from either end of tilting stud (265).

B. Pull stud from the position which will free entire lower unit including the swivel bracket.

C. By removing nut (280) from the tilt adjusting stud (279) and nut (277) from thrust socket stud (275), the two halves of the stern bracket may be separated. This will expose all internal parts of the stern bracket for inspection or replacement.

D. To remove tilt adjusting lever, remove key reverse check (270).

TO REASSEMBLE:

A. Clamp either of stern bracket assembly to edge of work bench and reassemble reversing the above procedure. (Refer Fig. 6-6).

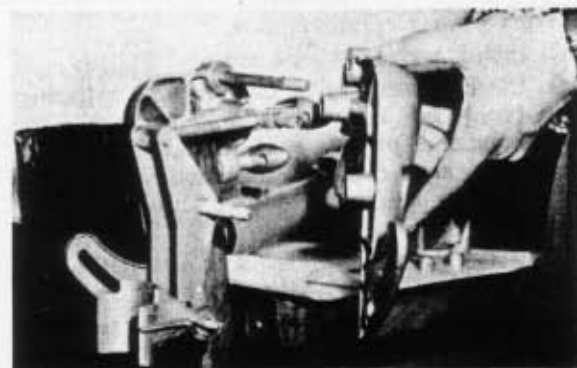


Figure 6-6

X.
STERN SWIVEL MECHANISM
(Refer Picture, Page 6-15)

TO DISASSEMBLE:

A. Tilt motor forward to horizontal position and remove swivel bracket nut (283) and the washer (282).

B. Loosen small allen head screw located beneath swivel bracket of front motor support tube casing.

C. Remove swivel retaining bolt (281) and separate the swivel assembly.

D. The swivel locking lever (285), spring (286) and bearing (287) may now be lifted from their respective positions.

TO REASSEMBLE:

A. Reverse above procedure. (CAUTION: It is very important when reassembling that the proper tension be given swivel retaining bolt. This may be checked by reassembling the swivel bracket and swinging the mechanism to feel for proper tension. If adjusted properly, lock swivel retaining screw with small allen set screw and secure by replacing lock washer and nut).

Note: On later models there has been a change in swivel bolt assembly. Refer Sec. X, S.B. 17.

XI.
LOWER UNIT
(Refer Picture, Page 6-14)

TO DISASSEMBLE:

A. Assuming propeller is off, disassemble gear case by removing two oval head screws and washers (211) from water pump housing (209).

B. Remove water pump housing (209) and pump rotor (207).

C. Remove snap ring (206) and pin (204) from pump eccentric.

D. Remove pump eccentric (205).

E. Remove pump plate (203).

F. Remove propeller shaft bearing housing assembly (201) and gasket. (CAUTION: When removing or replacing bearing housing assembly it is recommended that you unscrew the part to prevent damage to the lip of grease seal (202). If there is any indication of wear on seal, replace seal).

G. Remove propeller shaft (196) and gear assembly (197) and (198).

Note: It will be necessary to raise driveshaft several inches so that the propeller shaft and gear assembly can be disassembled.

H. Remove driveshaft (215), driveshaft seal enclosure (216) and water inlet tube (219).

I. Remove two motor support tube nuts (222) to separate gear case and intermediate housing (220) from balance of assembly.

J. Remove intermediate housing from gear case housing.

TO REASSEMBLE:

A. Check driveshaft grease seal (195) in gear case housing. Seal should be installed so that part number is down. Refer to Sec. X, S. B. 24.

B. Replace driveshaft enclosure and water inlet tube in gear case housing.

Note: If motor does not have a driveshaft seal enclosure, refer Sec. X, S.B. 9.

C. Replace intermediate housing on gear case and assemble to balance of motor by replacing two motor support tube nuts (222).

D. If bevel gear is separate from the propeller shaft assembly, use rivet (199). Insert a small amount of lower unit grease in thrust bearing of gear case and replace propeller shaft assembly.

E. Replace bevel pinion gear (198) in proper operating position and insert driveshaft into the gears splined opening.

F. Replace gasket (200) properly coated and propeller shaft bearing housing assembly (201).

G. Replace pump plate.

H. Replace pump eccentric, insert pin and replace snap ring.

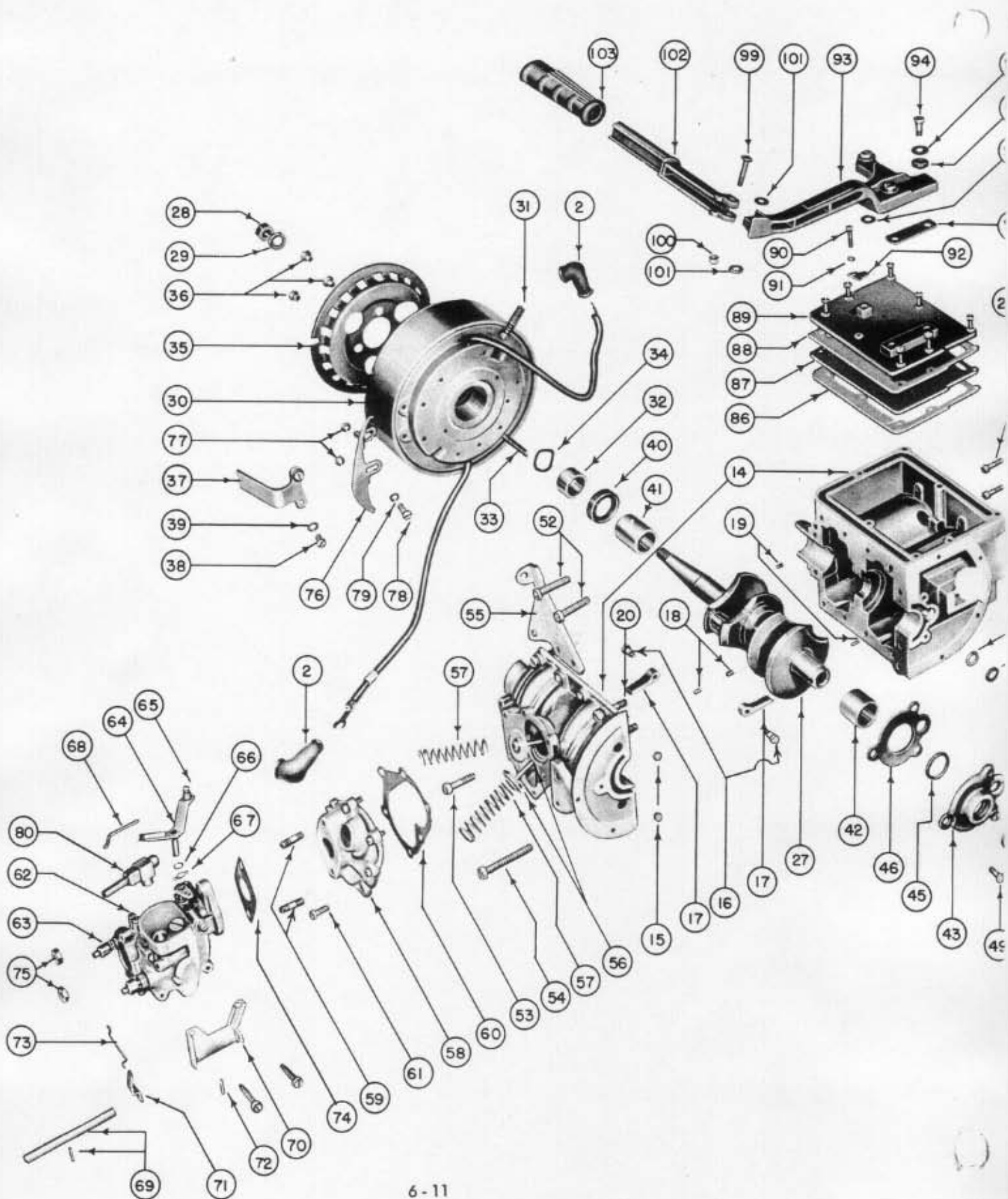
I. Insert the pump rotor into the water pump housing and reassemble on gear case.

(CAUTION: Pump rotor should be installed in pump housing so that tapered sides match housing. Side with small hole should be visible when placed in housing).

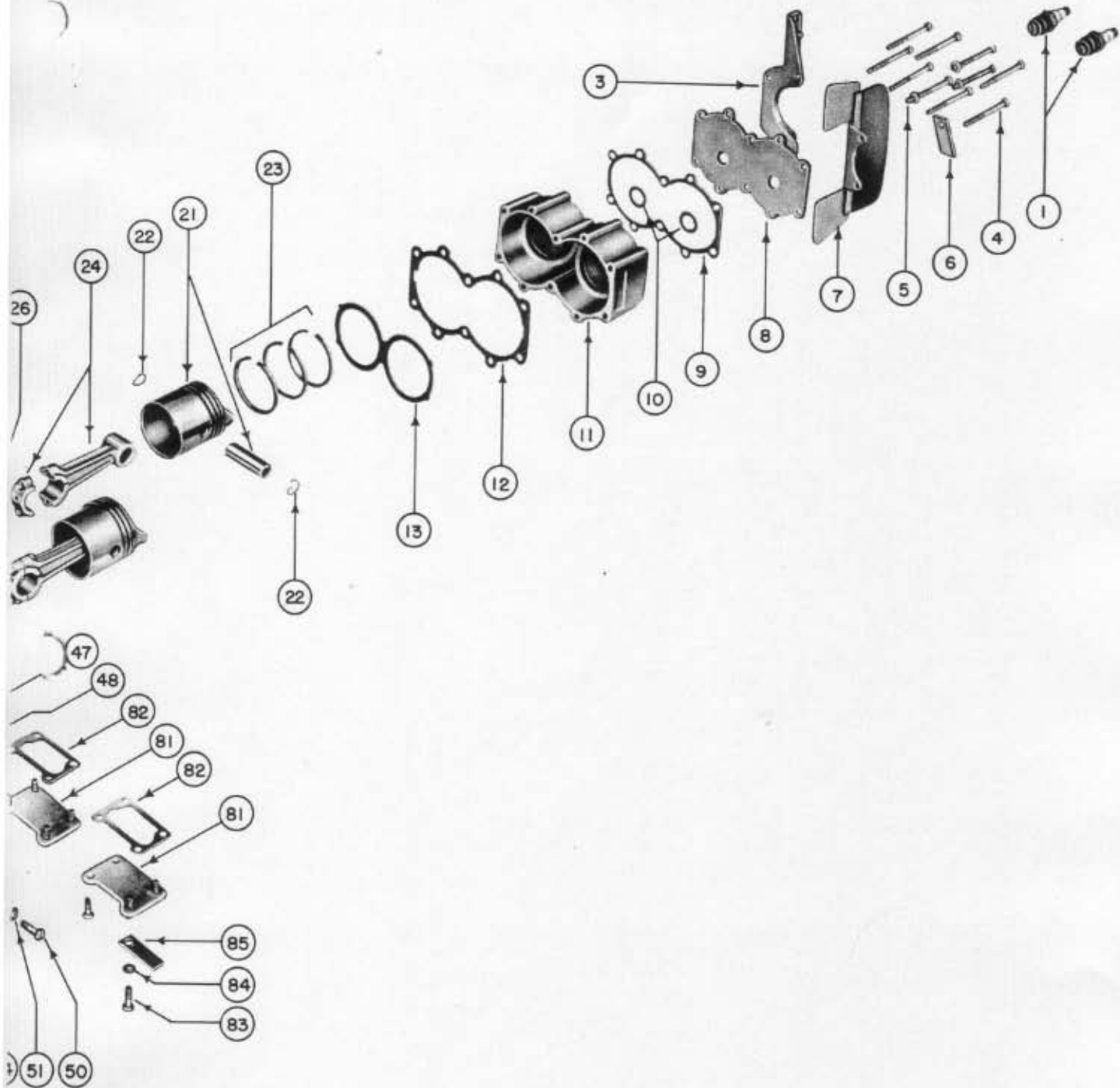
Note: Before replacing housing to balance of gearcase assembly be sure that water seal (208) is in proper position in gear case assembly.

J. Replace two oval head screws locking the entire assembly.

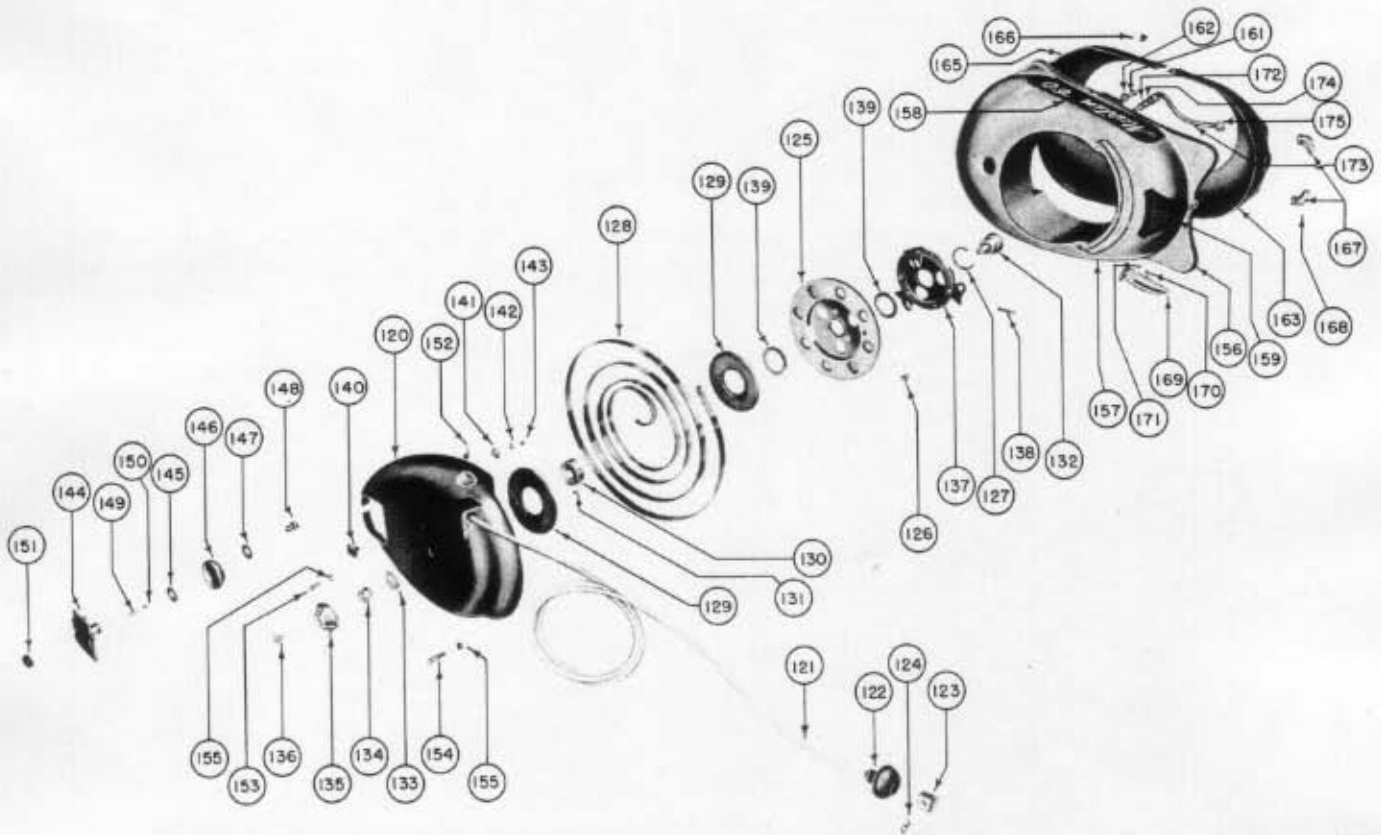
Martin Motors **POWER HEAD ASSEMBLY**



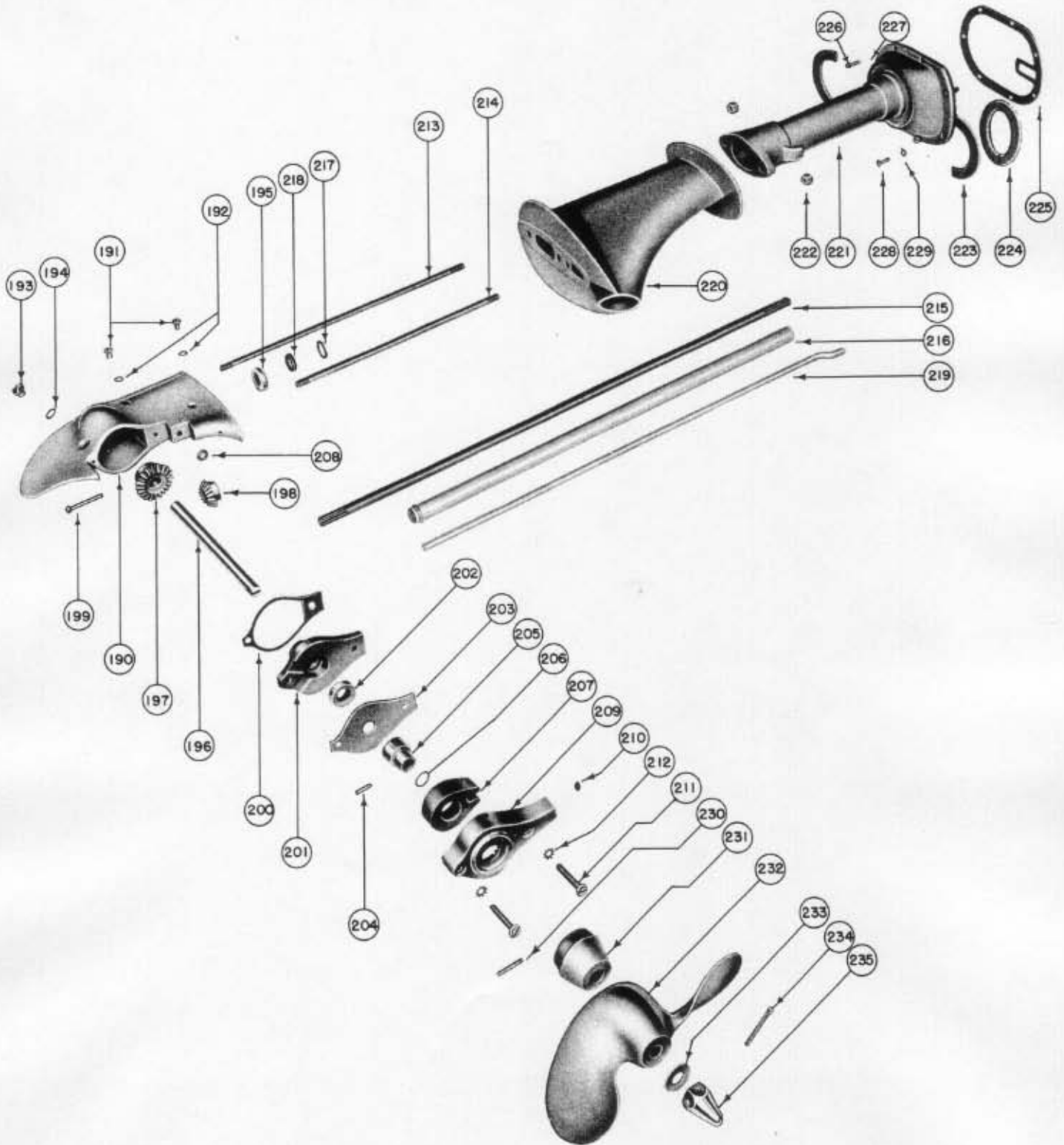
Martin Motors **POWER HEAD ASSEMBLY**



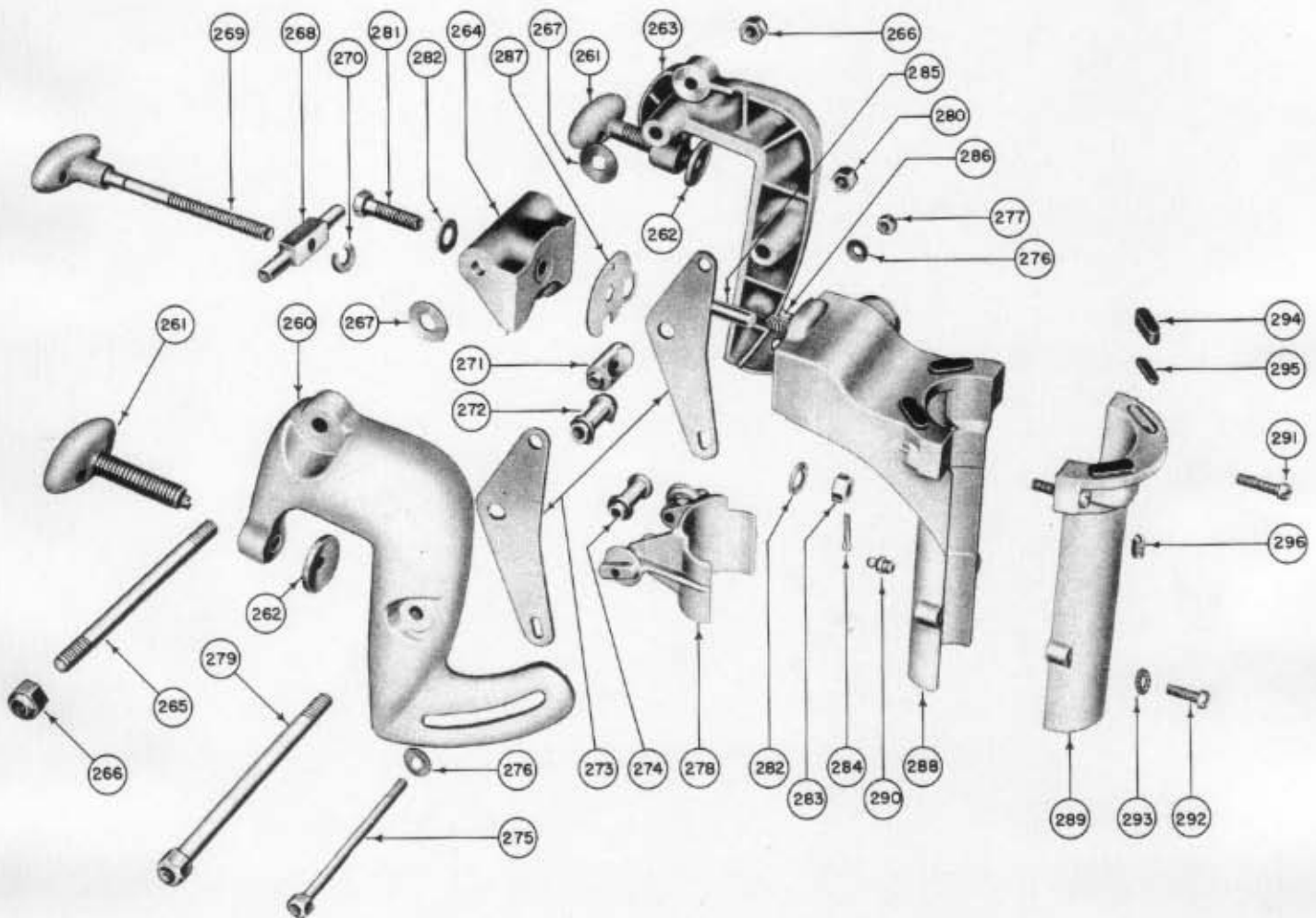
Martin Motors **STARTER and COVER ASSEMBLY**



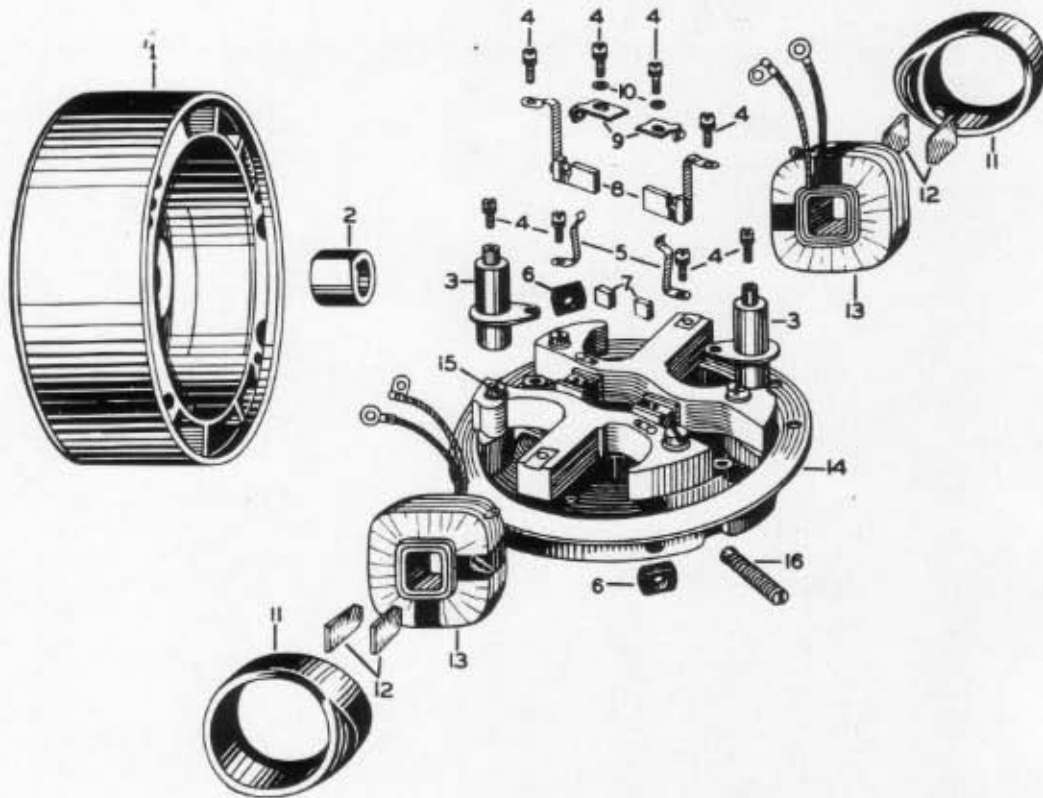
Martin Motors **LOWER UNIT ASSEMBLY**



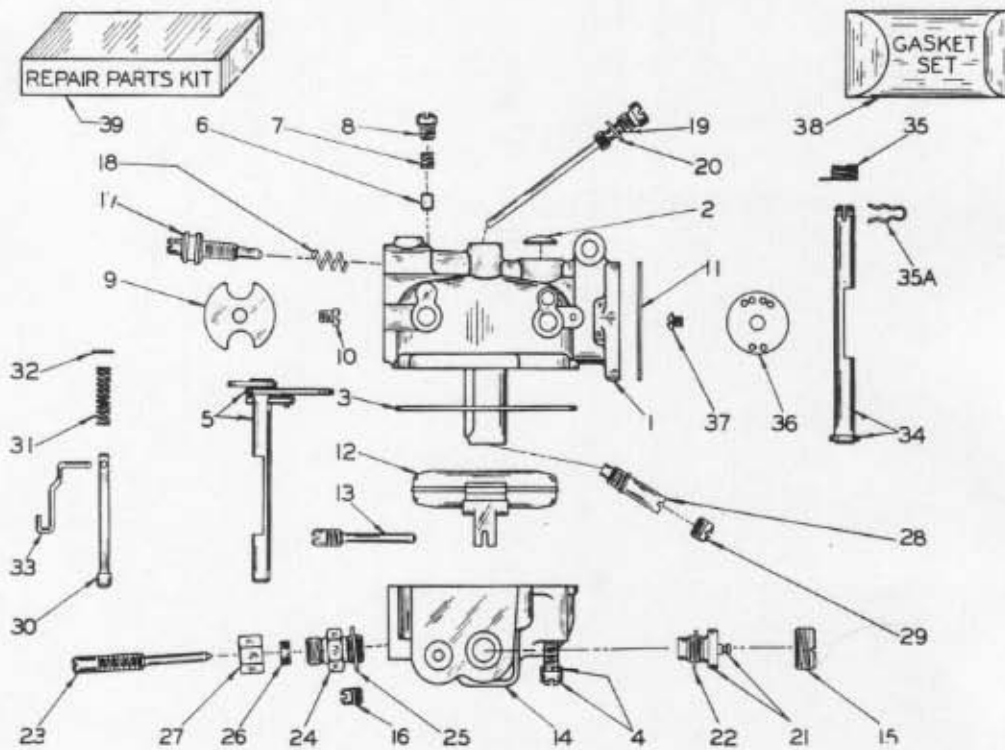
Martin Motors STERN BRACKET ASSEMBLY



Martin "60" - SERIES C5
WICO MAGNETO SERIES FW 2A-24



Martin "60" - SERIES C5
TILLOTSON CARBURETOR MODEL MD 15B



REPAIR PARTS LIST
Martin **"60"-SERIES C5**
POWER HEAD ASSEMBLY

Ref. No.	Part No.	Description
	25618	Powerhead Assembly Complete, Includes all Parts Listed to and Including Item 92
	25620	Powerhead Assembly—Same as 25618 less Carburetor and Magneto
1	100-S-1	Spark Plug and Washer
2	25605	Short Angle Rubber Nipple, for Spark Plug
3	25180	Tank Mounting Bracket (Rear)
4	2-S-12	Screw—Cylinder Head
5	35-S-17	Washer—Cylinder Head Screw
6	15152	Clip—Magneto Wire
7	25219	Spray Shield Assembly
8	25031	Cover—Cylinder Head
9	25095	Gasket—Cylinder Head Cover
10	25191	Gasket—Spark Plug
11	25040	Cylinder Head
12	25189	Gasket—Cylinder Head Water
13	25187	Gasket—Cylinder Head Compression
14	25114	Cylinder Block and Crankcase Assembly, Includes Item 14 to and Including Item 20 and Items 41 and 42
15	50-S-2	Expansion Plug
16	25640	Pin—Cam Follower
17	25641	Cam Follower
18	9-S-6	Screw—Cam Follower Pin
19	25154	Pin—Main Bearing Locating
20	15226	Taper Dowel Screw
21	25292	Piston and Wristpin Assembly
22	25064	Lock Spring—Wristpin
23	25223	Piston Ring
24	25354	Connecting Rod and Cap Assembly, Includes Items 24, 25 and 26 Inclusive
25	25344	Screw—Connecting Rod
26	37-S-3	Lockwasher—Connecting Rod Screw
27	25353	Crankshaft
28	20-S-1	Nut—Magneto
29	36-S-1	Lockwasher—Magneto Nut
30	25294	Magneto, Includes Items 30 to 34 Inclusive
31	15139	Friction Shoe—Magneto
32	15140	Cam—Magneto
33	25402	Key—Magneto
34	25315	Cam Spring Washer
35	25113	Starter Ratchet Ring
36	8-S-6	Screw—Starter Ratchet Ring
37	25205	Speed Control Lever
38	2-S-10	Screw—Speed Control Lever
39	36-S-4	Lockwasher—Speed Control Lever Screw
40	25266	Oil Seal—Crankshaft (Upper)
41	25185	Bearing—Upper Main
42	25182	Bearing—Lower Main
	25139	Seal Assembly—Lower Main Bearing, Includes Item 43 to 45 Inclusive
43	25422	Seal—Lower Main Bearing
44	25423	"O" Ring—Lower Main Bearing Seal
45	5036	Oil Seal—Crankshaft (Lower)
46	25293	Gasket—Lower Main Bearing Seal
47	41-S-1	Washer—Water Seal Retaining
48	25297	Washer—Water Tube Seal
49	3-S-4	Screw—Lower Main Bearing Seal (Oval Head)
50	2-S-31	Screw—Lower Main Bearing Seal (Fillister Head)
51	36-S-10	Lockwasher—For Seal Retaining Screw 2-S-31

} See Magneto Chart

WHEN ORDERING PARTS **ALWAYS** INDICATE MOTOR SERIAL NO.—MOTOR SERIES—AND MODEL

REPAIR PARTS LIST
Martin **"60"-SERIES C5**
POWER HEAD ASSEMBLY

Ref. No.	Part No.	Description
52	2-S-8	Screw—Block to Case
53	2-S-1	Screw—Block to Case
54	2-S-2	Screw—Block to Case
55	25672	Tank Mounting Bracket (Side)
56	25248	Valve Assembly
57	25166	Valve Spring
58	25403	Intake Manifold Assembly Includes Item 59
59	25197	Stud—Carburetor
60	25198	Gasket—Intake Manifold
61	2-S-4	Screw—Intake Manifold
	25215	Carburetor, Linkage and Choke Control Assembly, Includes Item 62 to and Including Item 73
62	25486	Carburetor Assembly
63	25321	Idle Adjusting Screw—See Carburetor Chart Tillotson No. 08427
64	15114	Linkage Lever Assembly, Includes Item 65
65	1-S-3	Screw—Linkage Adjusting
66	35-S-23	Washer—Lever Retaining
67	61-S-1	Cotter—Lever Retaining
68	15118	Rod—Carburetor Linkage
	25341	Choke Control Assembly, Includes Item 69 to and Including Item 72
69	25364	Choke Stem and Pin Assembly
70	25455	Bracket—Choke Control
71	25453	Arm—Choke Control
72	65-S-7	Pin
73	25454	Link—Choke Control
74	25199	Gasket—Carburetor
75	22-S-3	Nut—Carburetor
76	15109	Cam—Carburetor Control
77	25298	Spacer—Carburetor Control Cam
78	2-S-19	Screw—Cam Locating
79	36-S-4	Lockwasher—Cam Locating Screw
80	25275	Shut Off Cock
81	25076	Cover—Intake Port
82	25065	Gasket—Intake Port Cover
83	2-S-4	Screw—Intake Port Cover
84	36-S-5	Lockwasher—Intake Port Cover Screw
85	15152	Clip—Magneto Wire
86	25200	Gasket—Exhaust Port Cover Plate
87	25049	Plate—Exhaust Port Cover
88	25047	Gasket—Exhaust Port Cover
89	25048	Cover—Exhaust Port
90	2-S-11	Screw—Exhaust Port Cover
91	36-S-5	Lockwasher—Exhaust Port Cover Screw
92	15152	Clip—Magneto Wire
93	25613	Bracket—Steering Handle
94	25225	Bolt—Handle Bracket
95	35-S-25	Washer—Handle Bracket Bolt
96	25226	Grommet—Handle Bracket
97	25228	Washer—Handle Bracket
98	25227	Pressure Pad—Handle Bracket
99	3-S-3	Bolt—Steering Handle
100	26-S-1	Nut—Steering Handle
101	25287	Friction Washer
102	25612	Steering Handle
103	25342	Grip—Steering Handle

} Available only as Unit Part No. 25341

WHEN ORDERING PARTS **ALWAYS** INDICATE MOTOR SERIAL NO.—MOTOR SERIES—AND MODEL

REPAIR PARTS LIST
Martin "60"-**SERIES C5**
STARTER AND COVER ASSEMBLY

Ref. No.	Part No.	Description
	25619	Starter and Cover Assembly—Complete (black) Includes Items 120 to and Including Item 152
120	25650	Starter Housing (black)
121	25251	Starter Cord and Handle Assembly Includes Items 122 to and Including Item 124
122	25125	Starter Handle
123	25206	Starter Handle Plug Assembly Includes Item 124
124	4-S-2	Screw—Starter Handle Plug (Oval Head)
125	25127	Starter Pulley Assembly
126	72-S-1	Rivet—Starter Cord Retaining
127	25107	Spring—Starter Friction
128	25103	Rewind Spring
129	25338	Washer—Rewind Spring
130	25109	Anchor—Rewind Spring
131	8-S-5	Screw—Rewind Spring Anchor
132	25096	Starter Pivot Bolt
133	25269	Washer—Starter Pivot Bolt
134	24-S-1	Nut—Pivot Bolt
135	25173	Cover—Pivot Bolt
136	4-S-5	Screw—Pivot Bolt Cover
137	25121	Pawl Retainer Assembly
138	25244	Starter Bias Spring
139	25273	Spring Washer
140	25652	Filler Cap Latch (black)
141	25609	Tension Spring—Filler Cap Latch
142	35-S-4	Washer—Filler Cap Latch
143	17-S-1	Screw—Filler Cap Latch
	25604	Filler Cap Assembly—Complete (black) Includes Items 144 to and Including Item 151
144	25624	Filler Cap (black)
145	35-S-14	Spacer—Tank Seal
146	25188	Tank Seal
147	35-S-6	Washer—Tank Seal
148	25209	Bushing—Air Vent
149	90-S-4	Spring—Vent Seal
150	80-S-1	Ball—Vent Seal
151	25449	Pad—Air Vent Screw
152	25271	Retainer—Filler Cap
153	2-S-4	Screw—Starter Mounting (short)
154	2-S-6	Screw—Starter Mounting (long)
155	36-S-5	Lockwasher—Starter Mounting Screw
156	25600	Gas Tank and Decal Assembly Includes Item 157 to and Including Item 160
157	25255	Decal—Speed Control
158	25258	Decal—Side MARTIN "60"
159	25370	Decal—Operating Instructions
160	15188	Decal—Rear (Not Shown)
161	2-S-15	Screw—Tank Mounting
162	36-S-3	Lockwasher—Tank Mounting Screw
163	25623	Shroud Assembly (front) Includes Item 164
164	15212	Decal—Carburetor Control (Not Shown)
165	25616	Shroud—Rear
166	25218	Screw—Shroud Mounting
167	25487	Carburetor Control Knob, Includes Item 168
168	25359	Set Screw Control Knob
169	25611	Knob—Speed Control
170	8-S-3	Screw—Speed Control Knob
171	38-S-1	Lockwasher—Speed Control Knob
172	25254	Gas Line Fitting
173	25262	Gas Line Assembly, Includes Items 174 and 175
174	25340	Compression Sleeve
175	25339	Compression Nut

WHEN ORDERING PARTS **ALWAYS** INDICATE MOTOR SERIAL NO.—MOTOR SERIES—AND MODEL

REPAIR PARTS LIST
Martin **"60"-SERIES C5**
LOWER UNIT

Res. No.	Part No.	Description
	25518	Lower Unit Assembly Includes Item 190 to and Including Item 222
	25415	Gear Case Assembly Includes Item 190 to and Including Item 212
190	25416	Gear Case Housing Includes Items 191 to and Including Item 195
191	25245	Grease Plug
192	25268	Gasket—Grease Plug
193	25378	Grease—Plug
194	25379	Gasket—Grease Plug
195	40-S-6	Grease Seal for Drive Shaft
	25417	Propeller Shaft and Gear Assembly Includes Items 196, 197 to and Including Item 199
196	25010	Propeller Shaft
	25418	Gear Set Includes Item 197 to and Including Item 199
197	25055	Gear
198	25054	Pinion
199	70-S-3	Rivet—Gear and Shaft
200	25087	Gasket—Bearing Housing
201	25419	Propeller Shaft Bearing Housing Assembly, Includes Item 202
202	40-S-7	Grease Seal for Propeller Shaft
203	25005	Pump Plate
204	25084	Pin Pump Eccentric
205	25012	Pump Eccentric
206	25090	Snap Ring—Pump Eccentric
207	25089	Pump Rotor
208	25093	Water Pump Seal
209	25155	Water Pump Housing Includes Item 210
210	50-S-1	Expansion Plug
211	4-S-1	Pump Housing Screw
212	38-S-3	Lockwasher—Pump Housing Screw
213	25018	Stud—Lower Unit—Front
214	25017	Stud—Lower Unit—Rear
215	25290	Driveshaft
216	25428	Tube—Driveshaft Seal
217	25423	O—Ring—Lower Main Bearing Seal
218	25429	Spacer—Driveshaft Seal
219	25296	Water Tube
220	25004	Intermediate Housing
221	25020	Motor Support Tube Assembly
222	23-S-3	Nut—Lower Unit Stud
223	25150	Stabilizer Friction Ring
224	25243	Stabilizer Friction Washer
225	25074	Gasket—Motor Support Tube Assembly
226	2-S-11	Screw—Motor Support Tube Assembly (Fillister Head)
227	36-S-5	Lockwasher (Flat)
228	8-S-3	Screw—Motor Support Tube Assembly (Flat Head)
229	38-S-2	Lockwasher (Cone)
230	25156	Shear Pin
231	25157	Friction Clutch
232	25614	Propeller
233	35-S-3	Washer—Propeller Shaft
234	60-S-1	Cotter Pin
235	25085	Nut—Propeller

WHEN ORDERING PARTS **ALWAYS** INDICATE MOTOR SERIAL NO.—MOTOR SERIES—AND MODEL

REPAIR PARTS LIST
Martin **"60"-SERIES C5**
STERN BRACKET ASSEMBLY

Ref. No.	Part No.	Description
	25413	Stern Bracket Assembly Includes Items 260 to and Including Item 293
	25146	Stern Bracket Clamping Assembly (right) Included Items 260, 261 and 262
260	25053	Stern Bracket (right)
261	25145	Clamp Screw and Handle Assembly
262	25061	Pressure Pad
	25147	Stern Bracket Clamping Assembly (left) Includes Items 261, 262 and 263
263	25052	Stern Bracket (left)
264	25036	Swivel Bracket
265	25070	Tilting Stud
266	23-S-1	Nut
267	25286	Friction Washer
268	25141	Pin—Stern Adjusting Anchor
269	25140	Stern Adjusting Screw and Handle Assembly
270	25033	Key—Reverse Check
271	25023	Clevis Pin
272	25142	Spacer—Tilting Lever
273	25032	Tilt Adjusting Lever
274	25045	Spacer—Thrust Socket
275	25334	Stud—Thrust Socket
276	35-S-24	Washer—Thrust Socket Stud
277	23-S-2	Nut—Thrust Socket Stud
278	25029	Thrust Socket
279	25333	Stud—Tilt Adjusting Lever
280	23-S-1	Nut—Tilt Adjusting Lever Stud
281	25617	Swivel Retaining Screw
282	35-S-16	Washer—Swivel Bracket
283	21-S-2	Nut—Swivel Bracket
284	60-S-2	Cotter Pin—Swivel Bracket
285	25281	Swivel Locking Pin Assembly
286	90-S-3	Spring—Swivel Lock
287	25027	Swivel Bearing
288	25682	Motor Support Tube Casing Assembly Included Item 289
290	25337	Grease Fitting
291	2-S-7	Screw, Motor Support Tube Casing (Upper)
292	2-S-8	Screw—Motor Support Tube Casing (Lower)
293	39-S-2	Lockwasher—Motor Support Tube Casing Screw
294	25220	Stabilizer Compression Block (Rubber)
295	25221	Stabilizer Compression Plate (Steel)
296	13-S-1	Screw—Stabilizer Adjusting

WHEN ORDERING PARTS **ALWAYS** INDICATE MOTOR SERIAL NO.—MOTOR SERIES—AND MODEL

REPAIR PARTS LIST
Martin "60" - **SERIES C5**
TILLOTSON CARBURETOR MODEL MD 15B

Ref. No.	Part No.	Description
1	08532	Body, upper half
2	*02531	Body channel welch plug
3	07903	Body gasket
4	06062	Body Retaining Screw & Lockwasher
5	08531	Choke shaft and primer lever (complete)
6	*07923	Choke friction pin
7	*07925	Choke friction pin spring
8	*07912	Choke friction pin screw
9	08010	Choke shutter
10	05430	Choke shutter screw
11	05591	Flange gasket
12	07804	Float
13	*07901	Float lever pinion screw
14	08332	Fuel Bowl
15	07896	Fuel bowl plug screw (large)
16	*03311	Fuel Bowl Plug Screw (small)
17	*08427	Idle adjustment screw
18	*05725	Idle adjustment screw spring
19	*08426	Idle tube
20	02658	Idle tube gasket
21	*08018	Inlet needle, seat and gasket
22	02510	Inlet seat gasket
23	*08404	Main adjustment screw
24	0702	Main adjustment screw gland
25	0676	Main adjustment screw gland gasket
26	0705	Main adjustment screw packing
27	0703	Main adjustment screw packing nut
28	*08423	Main nozzle
29	02395	Main nozzle channel plug screw
30	07993	Primer Pin
31	08717	Primer Pin Return Spring
32	*03804	Primer Pin Washer
33	07995	Primer Pin Link
34	08421	Throttle Shaft and Lever
35	*07910	Throttle Return Spring
35A	*08597	Retaining Clip
36	08189	Throttle shutter
37	*05204	Throttle shutter screw
38	*08554	Gasket and packing set
39	08555	Repair parts kit

(*) Indicates contents of designated Repair Parts Kit

WHEN ORDERING PARTS, PLEASE INDICATE NUMBER OF YOUR CARBURETOR

REPAIR PARTS LIST

Martin "60" - SERIES C5
WICO MAGNETO SERIES FW 2A-24

Ref. No.	Part No.	Description
1	5479	Rotor
2	5465-F	Cam
3	X5463-F	Condenser assembly
4	5431-F	Condenser assembly clamp screw (SEMS)
4	5431-F	Fixed contact clamp screw (SEMS)
4	5431-F	Breaker spring clamp screw (SEMS)
4	5431-F	Condenser connecting clamp screw (SEMS)
5	5461-F	Breaker spring
6	5486-F	Lead wire bushing
7	5446-F	Cam wiper felt
8	X5449-F	Breaker shoe grp. (Use X5469-F Set)
9	5443-F	Fixed contact (Use X5469-F)
10	2965-F	Fixed contact clamp screw washer
11	5464-F	Coil terminal protector
12	2264A/B	Coil wedge
12	3497B-F	Coil wedge
13	X5460-F	Coil group
14	X5485-F	Stator plate replacement assembly
15	5445	Core screws
16	X5816-F	Friction shoe group
17	*2972-F	Shaft key
18	*3081-F	Cam spring washer
19	*5469-F	Breaker contact set (Includes fixed and movable contacts with brk. spring)
20}	2215-F	{Lead wire (15")
21}		{Lead wire (17")
22	5493	Stator plate unit
		MAGNETO COMPLETE

• Items marked as such are not shown in picture.

WHEN ORDERING PARTS **ALWAYS** INDICATE MOTOR SERIAL NO.—MOTOR SERIES—MODEL—
 AND NUMBER OF YOUR MAGNETO